# ARISE - C-130 Hercules 09/19/14 Science Report

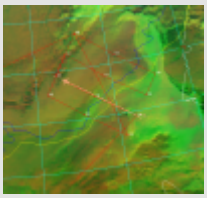
**Aircraft:**
C-130H Hercules #439 (See full schedule)
**Date:**
Friday, September 19, 2014
**Mission:**
ARISE
**Mission Location:**
Arctic Ocean
**Mission Summary:**

Radiation Wall Pattern - Flight #13

The objectives for today?s flight were to conduct a cloud-radiation wall pattern in a low cloud deck extending from the open ocean and across the sea-ice near 73N 130W. The weather cooperated and provided an extensive low cloud deck for the primary pattern, as well as an opportunity to characterize the sea-ice from high altitude with LVIS on the W-E transect to the target area. The LVIS sea-ice characterization was about 70% successful along the 1st half of the line due to some scattered low clouds, and unsuccessful due to overcast conditions on the 2nd half of the line. A high altitude radiation survey was made over the target area that had been chosen for the low cloud study. This was followed by a flat descent through the region to obtain a profile of atmospheric state. The wall pattern was set up on a single 200 km line from open ocean to concentrated sea-ice.
The cloud that was sampled was mostly single layered with base altitudes that were found to be close to the surface near the edge of the ice sheet, but higher over the open ocean (~1200 ft) and the more concentrated ice areas (500-700 ft). The cloud geometric thickness varied from about 5000 ft over the open ocean to about 700 ft at the opposite end over the sea ice. A series of legs were flown above cloud top, below cloud base (or 1000 ft, if the bases extended below 500 ft), and in a level stair step pattern to sample the cloud microphysics and radiative flux profiles. A haze layer was reported above the cloud top that was well characterized with 4STAR. There were numerous coincident satellite overpasses and all of the instruments were reported to work well. This appears to be another "golden day". The flight scientist was Anthony Bucholtz (NRL).

**Images:**

## September 19, 2014 Figure 1



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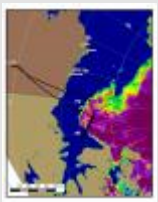
## September 19, 2014 Figure 2



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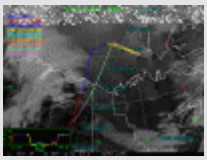
## September 19, 2014 Figure 3



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## September 19, 2014 Figure 4

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## September 19, 2014 Figure 5

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## September 19, 2014 Figure 6

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**Submitted by:**
William L. Smith Jr. on 09/21/14
**Related Flight Report:**

## C-130 Hercules 09/19/14 - 09/20/14

**Flight Number:**
Radiation Wall Pattern - Flight #13
**Payload Configuration:**
ARISE
**Nav Data Collected:**
Yes
**Total Flight Time:**
8.3 hours
**Submitted by:**
Luci Crittenden on 09/20/14
**Flight Segments:**

| | | | |
|---|---|---|---|
| **From:** | PAEI | **To:** | PAEI |
| **Start:** | 09/19/14 16:53 Z | **Finish:** | 09/20/14 01:11 Z |
| **Flight Time:** | 8.3 hours | | |
| **Log Number:** | 141002 | **PI:** | Christy Hansen |

| | |
|---|---|
| **Funding Source:** | Bruce Tagg - NASA - SMD - ESD Airborne Science Program |
| **Purpose of Flight:** | Science |
| **Comments:** | Successful science flight for ARISE on Alaskan deployment |

**Flight Hour Summary:**

| | 141002 | 151004 |
|---|---|---|
| **Flight Hours Approved in SOFRS** | 229 | |
| **Flight Hours Previously Approved** | | 88.7 |
| **Total Used** | 140.3 | 18.2 |
| **Total Remaining** | | 70.5 |

**151004 Flight Reports**

| Date | Flt # | Purpose of Flight | Duration | Running Total | Hours Remaining |
|---|---|---|---|---|---|
| 10/02/14 - 10/03/14 | Cal Flight | Science | 8.6 | 8.6 | 80.1 |
| 10/04/14 | Transit | Transit | 9.6 | 18.2 | 70.5 |

**Source URL:** https://airbornescience.nasa.gov/science_reports/ARISE_-_C-130_Hercules_09_19_14_Science_Report?destination=node/24681



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Page Editor: Erin Justice

NASA Official: Bruce A. Tagg



*Flight Reports began being entered into this system as of 2012 flights. If there were flights flown under an earlier log number the flight reports are not available online.*

**141002 Flight Reports**

| Date | Flt # | Purpose of Flight | Duration | Running Total | Hours Remaining |
|---|---|---|---|---|---|
| 08/24/14 | Engineering Check Flight | Check | 2.8 | 2.8 | 226.2 |
| 08/29/14 | Boom Calibration Flight | Check | 0.5 | 3.3 | 225.7 |
| 08/30/14 | Project Check Flight | Check | 5.2 | 8.5 | 220.5 |
| 09/01/14 | Transit (1 of 2) | Transit | 8.7 | 17.2 | 211.8 |

| | | | | | |
|---|---|---|---|---|---|
| 09/02/14 | Transit (2 of 2) | Transit | 6.6 | 23.8 | 205.2 |
| 09/04/14 - 09/05/14 | Arctic Ocean - Flight #1 | Science | 6.6 | 30.4 | 198.6 |
| 09/05/14 - 09/06/14 | 140W Sea Ice - Flight #2 | Science | 7.1 | 37.5 | 191.5 |
| 09/06/14 - 09/07/14 | Ice ZigZag-Terra - Flight #3 | Science | 7.1 | 44.6 | 184.4 |
| 09/07/14 - 09/08/14 | CERES Gridbox - Flight #4 | Science | 8.4 | 53 | 176 |
| 09/09/14 - 09/10/14 | CERES Gridbox - Flight #5 | Science | 7.7 | 60.7 | 168.3 |
| 09/10/14 - 09/11/14 | MIZ Lawnmower - Flight #6 | Science | 8.8 | 69.5 | 159.5 |
| 09/11/14 - 09/12/14 | CERES Gridbox - Flight #7 | Science | 7.5 | 77 | 152 |
| 09/13/14 - 09/14/14 | CERES Gridbox - Flight #8 | Science | 8.3 | 85.3 | 143.7 |
| 09/15/14 - 09/16/14 | CERES Gridbox - Flight #9 | Science | 8.1 | 93.4 | 135.6 |
| 09/16/14 - 09/17/14 | Radiation Wall Pattern - Flight #10 | Science | 8.3 | 101.7 | 127.3 |
| 09/17/14 - 09/18/14 | CERES Gridbox - Flight #11 | Science | 7.2 | 108.9 | 120.1 |
| 09/18/14 - 09/19/14 | Sea Ice Albedo/CryoSat - Flight #12 | Science | 8.6 | 117.5 | 111.5 |
| 09/19/14 - 09/20/14 | Radiation Wall Pattern - Flight #13 | Science | 8.3 | 125.8 | 103.2 |
| 09/21/14 - 09/22/14 | Sea Ice & Radiation - Flight #14 | Science | 8.2 | 134 | 95 |
| 09/24/14 - 09/25/14 | Gridbox TOA+Surface - Flight #15 | Science | 6.3 | 140.3 | 88.7 |